
क्लोज कप्लिंग युक्तियाँ (सीसीडी) और
सीसीडी के अनुमोदित प्रकार की फिटिंग से
संबंधित वाहनों का अनुमोदन

Approval of A Close-Coupling
Device (CCD) and Vehicles
with Regard to The Fitting of
an Approved Type of CCD

ICS 65.060.10

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FOREWORD

This Indian Standard was adopted by Bureau of Indian Standards after the draft finalized by the Transport Tractors, Trailers and Industrial Trucks Sectional Committee had been approved by the Transport Engineering Division Council.

Close Coupling Devices (CCDs) automatically provides sufficient space between the bodies of towing vehicle and trailers, if additional clearance is needed during angular movement between them. Safety of such devices and their fitment to vehicles are to be addressed to have safer and reliable road transportation.

Considering the importance of the subject of Close Coupling Devices (CCDs), it was identified in the Roadmap for Automotive Safety Regulations for formulation of standard in line with ECE R 102. Though such devices are not mandatory in other countries, this standard will provide guidelines for CCD manufacturers, vehicle manufacturers, testing agencies and users, when such devices are used in India. Thus, enhancement of safety and performance levels of the vehicles when used on the road could be achieved. Various aspects of the coupling and its requirement are addressed in the right perspective.

Formulation of this standard has been undertaken to harmonize it with AIS-092. In the formulation of this standard, assistance has been derived from:

- ECE R 102 Uniform Provisions Concerning the approval of:
 - a) A Close-Coupling Device (CCD)
 - b) Vehicles with regard to the fitting of an approved type of CCD

In case of any variance between the standard and *Central Motor Vehicles Rules, 1989*, later shall prevail.

Central Motor Vehicles Rules refers to many Automotive Industry Standards (AIS) formulated by Automotive Industry Standards Committee (AISC) till such time corresponding BIS Specifications are notified. Under the same provision Automotive Industry Standards (AIS) referred in this Indian Standard will be replaced by BIS Standards after corresponding BIS Standards are formulated and notified.

The composition of the Committee responsible for the formulation of this standard is given in Annex E.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

APPROVAL OF A CLOSE-COUPPLING DEVICE (CCD) AND VEHICLES WITH REGARD TO THE FITTING OF AN APPROVED TYPE OF CCD

1 SCOPE

This standard applies to vehicles of categories N2, N3, T3 and T4 as defined in IS 14272.

2 REFERENCES

The following standards contains provision, which through reference in this text constitutes provision of the standard. At the time of publication, the edition indicated were valid. All standards are subject to revision and parties to agreements based on this standard is encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

<i>IS / SDO Standard No.</i>	<i>Title</i>
14272 : 2011	Automotive vehicles — Types — Terminology (<i>first revision</i>)
AIS 037	Procedure for type approval and establishing conformity of production for safety critical components
AIS 091 (Part 1)	Automotive vehicles — mechanical coupling components of combinations of vehicles other than agricultural tractors requirements
AIS 092	Approval of (I) A close coupling device (CCD); (II) vehicles with regard to the fitting of an approved type of CCD

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Close-coupling Device (CCD)

A device which automatically provides sufficient space between the bodies of towing vehicles and trailers, if additional clearance is needed during angular movement between them. Coupling devices having no adjusting effect on lengths and/or angles within the device are not covered by this standard.

3.2 Approval of a Device

It means the approval of a type of close-coupling device conforming to the requirements as set-out in 4 to 8.

3.3 Approval of a Vehicle

It means the approval of a vehicle with regard to the fitting of an approved close-coupling device;

3.4 Vehicle Type

Vehicle type means the vehicles which do not differ in essential respects such as:

- a) The make and type of the close-coupling device;
- b) The length and width of the vehicles;
- c) The mass of the vehicles;
- d) The points of attachment of the close-coupling device;
- e) The vehicle description (for example truck, tractor, trailer, semi-trailer, centre-axle trailer); and
- f) Steering equipment (for example auxiliary steering equipment, steering equipment of the trailer).

3.5 Type of Close-coupling Device

The type of close-coupling devices means the devices which do not differ in essential respects such as:

- a) The make and type of the device;
- b) The operating principle;
- c) The means of attachment to vehicles;
- d) The overall dimensions at minimum and maximum extension;
- e) The limits of the operating angles; and
- f) The kinematic characteristics in relation to the angles of articulation;

3.6 Automatic Coupling Procedure

A coupling procedure is automatic, if reversing the towing vehicle against the trailer is sufficient to engage the coupling completely and properly and to secure it automatically and to indicate proper engagement of the safety devices without any external intervention.

4 TECHNICAL INFORMATION TO BE SUBMITTED BY THE MANUFACTURER FOR APPROVAL OF A CLOSE-COUPPLING DEVICE

4.1 The application for approval of a close-coupling device (CCD) shall be submitted by the manufacturer of the CCD or by his duly accredited representative.

4.2 It shall be accompanied by the following:

- a) In triplicate, a detailed description and fully dimensioned scale drawings of the CCD and the method of installation. The submitted documents shall show to the satisfaction of the test agency that the CCD will function reliably and safely.
- b) A sample of the CCD type to be approved;
- c) A combination of vehicles representing the worst case condition, fitted with the CCD to be approved, shall be selected in conjunction with the test agency responsible for conducting the approval tests taking into account such aspects as suspension, maximum allowable mass and dimensions, wheelbase, number and position of axles and the extreme positions of the close-coupling device. More than one combination of vehicles shall be provided, if required by the test agency.
- d) Technical information as required in Annex A.

4.3 Test agency shall verify the existence of satisfactory arrangements for ensuring effective control of conformity of production before type approval is granted.

5 APPROVAL

5.1 All parts required for the installation and safe operation of a close coupling device (for example parts subject to towing and/or steering forces fixed to the chassis of the towing vehicle or the trailer, and control systems) are subject to type approval.

5.2 If the CCD submitted for approval pursuant to this standard meets the requirements of 6, approval of that CCD type shall be granted. (NOTE - Until uniform test procedures have been agreed, the manufacturers shall provide the test agency with their test procedures and results).

6 SPECIFICATIONS

6.1 General

6.1.1 The CCD shall be so designed, constructed and assembled such that a vehicle fitted with the CCD conforms to the requirements of this standard under normal conditions of road use. The coupling devices themselves shall comply with the technical requirements of AIS-091 (Part 1). Additional forces, which may be

caused by the assembled CCD in operation, shall be taken into account.

6.1.2 The operation of the CCD shall be automatic. Even the reverse movement of the close-coupled combination shall be possible without any manual action at the CCD.

6.1.3 In particular, the CCD shall be designed, constructed and assembled so as to be resistant to all stresses, corrosion and ageing to which it may be subjected (for example vibration, humidity, extreme temperatures).

NOTE — Until uniform test procedures have been agreed, manufacturers shall provide the test agency with their test procedures and results.

6.1.4 The CCD shall enable vehicles to travel in a straight line on a level road, without any abnormal effort being applied to the steering control, either forwards or in reverse.

6.1.5 System Failures

6.1.5.1 Any power system failure and/or control system failure of the CCD, while the vehicle is running, shall cause the coupling to extend and remain in that position. Separation of the towing vehicle and trailer shall be prevented by mechanical means under all conditions of use.

6.1.5.2 Any power system and/or control system failure shall be indicated to the driver by an acoustic and an optical signal.

6.1.6 When the vehicles are stationary, no uncontrolled movement of the CCD may occur under any circumstances, including long term uphill parking.

6.1.7 Non-automatic movement of the CCD may be possible only when the towing vehicle is stationary. An instruction to apply the parking brake of the towing vehicle shall be permanently attached to the control unit.

6.1.7.1 This operation shall be controlled by means of a dual control unit.

6.1.7.2 This control unit shall be fitted outside the driver's cabin and shall be situated in such a position that the operator is not endangered by the movement of the trailer and can see the danger area between the vehicles at a glance.

6.1.7.3 It shall not be possible to lock the control unit in the operating position or operate it unintentionally.

6.1.7.4 The movement of the trailer shall take place without jolting, that is at a speed of not more than 50 mm/sec.

6.1.7.5 Release of a control shall stop the movement immediately.

6.1.8 Forward movement of the towing vehicle shall not result in rearward movement of the trailer in relation to the road surface. Rearward movement of the trailer of not more than 30 mm is permitted for switch and react purposes only.

6.1.9 The CCD shall return to its shortest normal straight ahead operating position following relative angular movement between towing vehicle and trailer, in accordance with Annex-C.

6.1.10 Operation of the CCD shall not interfere with the dynamic stability of the combination. This requirement shall be checked during the tests described in Annex C.

6.1.11 The CCD shall be designed so as to enable the vehicles to be coupled or uncoupled. All coupling operations shall be automatic, including the mechanical controls and the parts subject to towing and/or steering forces. Correct engagement of the positive locking system shall be indicated or be easily visible from the side of the vehicle alongside the coupling device. Otherwise, a remote indication shall be installed in the driver's cabin. Manual coupling of control and power supply lines is permitted provided the connections are readily accessible from a standing position and the combination can be safely driven, without these lines being connected.

6.1.12 The CCD when engaged shall itself provide at least the following angular movement:

	<i>Full Trailer</i>	<i>Centre Axle Trailer</i>	<i>Semi-Trailer</i>
<i>Horizontal</i>	$\pm 60^\circ$	$\pm 90^\circ$	$\pm 90^\circ$
<i>Vertical</i>	$\pm 20^\circ$	$\pm 15^\circ$	$\pm 12^\circ$
<i>Axial</i>	$\pm 15^\circ$	$\pm 15^\circ$	--

6.1.13 For hydraulic or pneumatic CCD's, an optical signal shall indicate that the CCD is about to reach its maximum extension. This signal may be the same as the optical signal mentioned in **6.1.5.2**.

6.1.14 The CCD shall be designed in such a way that when coupling at an angle between the towing vehicle and trailer different from that when uncoupled, unintentional movement of the trailer or incorrect functioning of the CCD does not occur.

6.1.15 A plate specifying the maximum mass of the towing vehicle and the trailer, all lubrication points and the frequency of lubrication shall be affixed such that it is clearly visible even when the trailer is coupled.

6.2 Tests

The tests which the CCD shall undergo for approval are described in Annex C.

7 MODIFICATION OF CCD TYPE AND EXTENSION OF APPROVAL

7.1 Any modification of the CCD type shall be notified to the test agency which approved the CCD type. The test agency may then either;

- Consider that the modifications made are unlikely to have an appreciable adverse effect and that the device still complies with the requirements; or
- Request a further test report.

7.2 In case of **7.1(a)**, tests for only those parameters which are affected by the modifications, shall be carried out.

7.3 In case of fulfillment of criteria of **7.1(a)** or after successful results of further verification as per **7.1(b)**, the approval of compliance shall be extended for the changes carried out.

8 CONFORMITY OF PRODUCTION

8.1 Every CCD approved under this standard shall be manufactured so as to conform to the type approved by meeting the requirements set out in **6**.

8.2 Conformity of production procedures as laid down in AIS-037 shall be applicable.

8.3 The test agency which has granted type approval may at any time verify the conformity control methods applicable to each production unit. The normal frequency of inspections authorized by the test agency shall be once, every two years.

9 APPROVAL OF VEHICLES WITH REGARD TO THE FITTING OF AN APPROVED TYPE OF CCD (TECHNICAL INFORMATION TO BE SUBMITTED BY A VEHICLE MANUFACTURER FOR APPROVAL OF A VEHICLE FITTED WITH A CLOSE-COUPLED DEVICE)

9.1 The application for approval of a vehicle type with regard to the fitting of a CCD of an approved type shall be submitted by the vehicle manufacturer or by his duly accredited representative.

9.2 It shall be accompanied by the under mentioned documents in triplicate and the following particulars:

9.3 A detailed description of the vehicle type and the vehicle parts connected to the CCD, including a dimensioned drawing of the fixing points and the information and documents referred to in Annex B.

9.4 At the request of the Test Agency, the approval form (that is, the form indicated in Annex A) for each type of CCD shall also be supplied.

9.5 A vehicle, representative of the vehicle type to be approved, fitted with a CCD, shall be submitted to the Test Agency conducting the approval test.

9.5.1 A vehicle not having all the components appropriate to the type may be accepted provided that the applicant can show to the satisfaction of the Test Agency that the absence of the components omitted has no effect on the results of the inspections as far as the requirements of this standard are concerned.

9.6 The Test Agency shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.

9.7 Special operating instructions shall be provided for coupling operations deviating from usual ones, which shall contain in particular, instructions regarding coupling and uncoupling with different modes of operation (for example angled positions). Each vehicle shall be accompanied by such special operating instructions.

10 APPROVAL

10.1 If the vehicle submitted for approval is fitted with an approved CCD and meets the requirements of **13**, approval of that vehicle type shall be granted.

11 REQUIREMENTS CONCERNING THE FITTING OF AN APPROVED CCD

11.1 The requirements of **6.1**, excluding **6.1.12** have to be fulfilled when the CCD is fitted to the vehicle, despite any influences which may be caused by the operation of the vehicle.

11.2 The CCD in use shall not impede the movement of the vehicles to which it is fitted. This condition shall be deemed to have been met, if the test requirements described in Annex C are complied with.

11.3 Warning signal as mentioned in **6.1.5.2** and **6.1.13**.

11.3.1 The acoustic device shall be located in the driver's cabin and shall be easily audible by the driver under all circumstances, when the vehicle is in normal use.

11.3.2 The optical signal shall be red in colour and located on the instrument panel in the direct field of vision of the driver and shall be easily visible even in daylight.

11.4 Coupling and uncoupling shall be possible with coupling angles of up to 50° horizontally both to the right and left, up to 10° vertically both upward and downward with full trailers, up to 6° vertically both upward and downward with centre axle trailers and up to 7° when twisted axially in both directions, that

is, it shall be possible to couple the trailer up to the above-mentioned angular positions between towing vehicle and trailer drawbars without the necessity of intervention of additional personnel.

During automatic coupling, it is permitted for a temporary position to be arranged before final coupling is effected. The temporary position shall permit the combination to be safely maneuvered. If the final action is operated manually, the space between the vehicles shall be at least 500 mm.

11.5 It shall be possible from the standing position for one person to position the coupling devices prior to the coupling procedure, without the use of tools. This requirement also applies to the connection and disconnection of the braking and electrical lines.

11.6 General Requirements

To allow automatic coupling, the drawbar eye shall be adjustable vertically to the centre height of the coupling device under all usual traffic and operational conditions.

12 MODIFICATIONS OF THE VEHICLE TYPE AND EXTENSION OF APPROVAL

12.1 Any modification of the vehicle type as defined in **3.1.4** shall be notified to the administrative department which approved the vehicle type. The department may then either,

- a) consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the vehicle still conforms to the requirements, or
- b) require a further test report.

12.2 In case of **12.1(a)**, tests for only those parameters which are affected by the modifications, shall be carried out.

12.3 In case of fulfillment of criteria of **12.1(a)** or after successful results of further verification as per **12.1(b)**, the approval of compliance shall be extended for the changes carried out.

13 CONFORMITY OF PRODUCTION PROCEDURES

13.1 Every vehicle approved under this standard shall be manufactured so as to conform to the type approved by meeting the requirements set out in **11**.

13.2 Whole vehicle conformity of production procedures shall be applicable as and when laid down.

13.3 The test agency which has granted type approval may at any time verify the conformity control methods applicable to each production unit. The normal frequency of inspections authorized by the test agency shall be once every two years.

ANNEX A

[Clause 4.2(d) and 9.4]

**TECHNICAL INFORMATION TO BE SUBMITTED BY THE MANUFACTURER
FOR APPROVAL OF A CLOSE-COUPLING DEVICE**

A-1 Following technical information shall be submitted by the manufacturer for the approval of a close coupling device:

- a) Trade Name or Mark of the CCD
- b) CCD type
- c) Manufacturer's Name and Address
- d) If applicable, Name and Address of manufacturer's representative
- e) Brief description of the CCD
- f) Type
 - 1) Vehicle on which the CCD was Tested

- 2) Brief Description Including Information with Regards to **3.2.3**
- g) Minimum Space Between Motor Vehicle and Towed Vehicle
- h) Maximum Extension of Device
- j) Restrictions of use on Vehicles which may be utilized (Strike out what does not apply)
(for example Truck, Tractor, Trailer, Semi-trailer, Centre Axle Trailer)
 - 1) Maximum permissible Mass of the Trailer
 - 2) Maximum permissible Mass of the Tractor

ANNEX B

(Clause 9.3)

**TECHNICAL INFORMATION TO BE SUBMITTED BY A VEHICLE MANUFACTURER FOR
APPROVAL OF A VEHICLE FITTED WITH A CLOSE - COUPLING DEVICE**

B-1 Following technical information to be submitted by a vehicle manufacturer for approval of a vehicle fitted with a close-coupling device:

- a) Trade Name or Mark of Vehicle
- b) Vehicle Type
- c) Manufacturer's Name and Address
- d) If applicable, Name and Address of Manufacturer's Representative
- e) Vehicle Category N2, N3, T3, T4 (Strike out what does not apply)
- f) Brief Description of the Vehicle Type in respect of the CCD (for example Truck, Tractor, Trailer,

Semi-Trailer, Centre-Axle Trailer)

- 1) Maximum Permissible Mass of the Trailer
- 2) Maximum Permissible Mass of the Tractor

B-7 Trade Name or Mark of the CCD(s) and its/their approval Numbers

B-8 Minimum Space between Towing Vehicle and Towed Vehicle

B-9 Maximum Length of Vehicles with the CCD(s) in running position

B-10 Restriction on Vehicles to be coupled to the Vehicle Type

ANNEX C

(Clause 6.1.10)

REQUIREMENTS CONCERNING TESTS AND PERFORMANCE**C-1 CCD RECOVERY DISTANCE**

C-1.1 The towing vehicle/trailer combination shall be driven, from a straight ahead position, around a bend having an outside radius of 12.5 m and stopped when the towing vehicle has turned through an angle of 90° (yaw-angle). The combination shall then be accelerated

as quickly as possible up to a speed of 30 ± 2 km/h and be maintained at this speed until completion of the test. Full retraction of the CCD shall have taken place within 150 m from the acceleration start position (*see* fig. 1).

This test shall be conducted in both left and right directions.

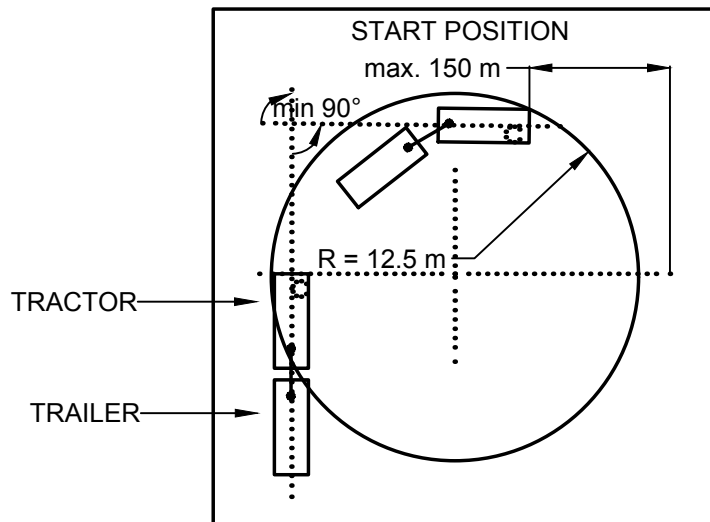


FIG. 1 LAYOUT FOR CCD RECOVERY DISTANCE TEST

NOTE — Compliance with these requirements does not guarantee that the overall length of the vehicle combination is legal in all driving conditions.

C-1.2 The test agency shall verify that some retraction of the CCD takes place all the time, the towing vehicle is moving forward.

NOTE — For the purposes of approvals under 9 to 13, the test agency may take into account tests conducted for the purposes of 4 to 8.

C-2 STABILITY OF THE COMBINATION

For the approvals, the stability performance shall be measured during road tests conducted in the following conditions.

C-2.1 Test Conditions

C-2.1.1 Loading Conditions

C-2.1.1.1 The vehicles shall be laden, the distribution of mass among the axles being that stated by the manufacturers of the vehicles; where provision is made for several arrangements of the load on the axles, the distribution of the maximum mass among the axles shall be such that the mass on each axle is proportional to the maximum permissible mass for each axle.

C-2.1.1.2 The height of the centre of gravity of the vehicles shall be at least 1.7 m.

The actual loading condition shall be specified in the test report. For vehicles designed for use with a centre of gravity lower than 1.7 m, the test may, at the discretion of the approval authority, be conducted at the lower figure.

In this case the maximum centre of gravity height shall be stated on the information plate required by 5.1.1.5.

C-2.1.2 The test shall be carried out at the speeds prescribed for each type of test. If the maximum design speed of a vehicle is lower than the speed prescribed for a test, the test shall be performed at the vehicle's maximum speed.

C-2.1.3 The road shall be level and shall have a surface affording good adhesion;

C-2.1.4 The tests shall be performed when there is no wind liable to affect the results;

C-2.1.5 At the start of the tests, the tyres shall be cold and at the pressure prescribed by the manufacturer of the vehicles or tyres for the load actually borne by the wheels when the vehicles are stationary; substantially new tyres shall be used.

C-2.1.6 The prescribed performance shall be obtained without self-amplifying reactions, without deviation of the vehicles from their course, and without unusual vibration in the steering and coupling system.

C-2.2 Straight Line Stability Test

C-2.2.1 Vehicles shall be tested at a speed of km/h and remain aligned. During the test, it shall be possible to travel along a straight section of the road without unusual steering correction by the driver.

C-2.2.2 An emergency straight line braking test from a speed of 60 km/h to rest at a mean fully developed deceleration of at least 4 m/s² shall not cause the combination to deviate outside a lane 3.5 m wide.

NOTE — The test agency shall take account of the predominance setting of the combination.

C-2.2.3 Starting from rest, a forward acceleration of at least 2m/s² shall not cause any movement between

the vehicles of a degree likely to cause the driver difficulty in controlling the vehicle combination (if the acceleration prescribed for this test cannot be reached by a vehicle combination, the test shall be performed with the maximum acceleration available).

C-2.2.4 No permanent deformation shall take place during the above tests.

C-2.3 Change of Lane

C-2.3.1 A simulated overtaking manoeuvre, as defined in the Annex D, conducted at a progressively increasing speed up to 80 km/h, shall not cause the driver any difficulty in controlling the combination.

C-2.3.2 At a speed of 20 km/h steering from one side of the track to the other alternately at least 3 times by turning the steering wheel as fast and as far as possible, no contact between the vehicles or damage to the CCD shall occur (track width is 10 metres).

C-3 CIRCULAR MOVEMENT

C-3.1 Starting from rest and a straight ahead position, the combination shall be driven around a curve of 25 m radius to a speed of 20 km/h at an acceleration of 2 ± 10 percent m/s^2 . This shall not cause any movement between the vehicles of a degree likely to cause the driver difficulty in controlling the vehicle combination.

C-3.2 With the towing vehicle and trailer having adopted a steady state, turn so that the front outside edge of the towing vehicle describes a circle of radius of 25 m, at a constant speed of 5 km/h. The circle described by the rearmost outer edge of the trailer shall be measured. This manoeuvre shall be repeated under the same conditions but at a speed of 25 ± 1 km/h.

During these maneuvers, the rearmost outer edge of the trailer, travelling at a speed of 25 ± 1 km/h, shall not

move outside the circle described during the manoeuvre at a constant speed of 5 km/h by more than 0.70 m (*see* Fig. 2).

C-3.3 No part of the trailer shall move more than 0.5 m beyond the tangent to a circle with a radius of 25 m when towed by a vehicle leaving the circular path along the tangent while maintaining the speed of 25 km/h. This requirement shall be met from the point the tangent meets the circle to a point 40 m along the tangent. After that point the trailer shall travel without excessive deviation or unusual vibration in its steering equipment (*see* Fig. 3).

C-3.4 Any motor vehicle or combined vehicle which is in motion shall be able to turn within a swept circle having an outer radius of 12.50 m and an inner radius of 5.30 m. The test shall be conducted in both left and right directions. No part of the combination, where it penetrates the circle from a tangent, may overlap that tangent by more than 0.8 m beyond the point of intersection (*see* Fig. 4).

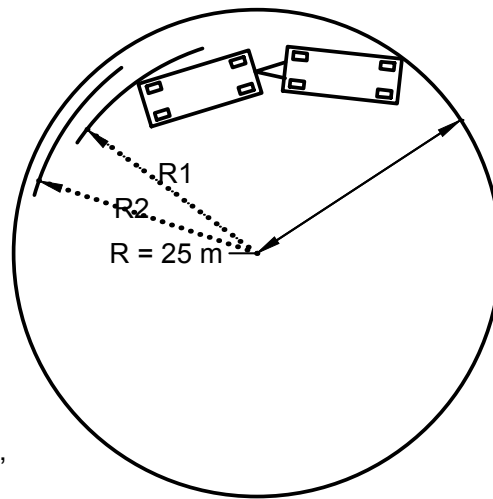
C-4 SLOPES

C-4.1 When positioned longitudinally in line and in the normal operation position:

C-4.1.1 There shall be no unintentional contact between any part of the towing device and the towing vehicle or trailer when the vehicles are positioned at a relative vertical angle of 6° .

C-4.1.2 No contact shall occur between the bodies of the towing vehicle and trailer at a relative vertical angle of 5° .

C-4.2 The requirements of 5.1.1 and 5.1.2 may be verified by calculation at the discretion of the test agency.



FOR,

R1, $\gamma = 5 \text{ km/h}$

R2, $\gamma = 25 \text{ km/h}$

$R2 - R1 = 70 \text{ cm (max.)}$

FIG. 2 LAYOUT FOR CIRCULAR MOVEMENT

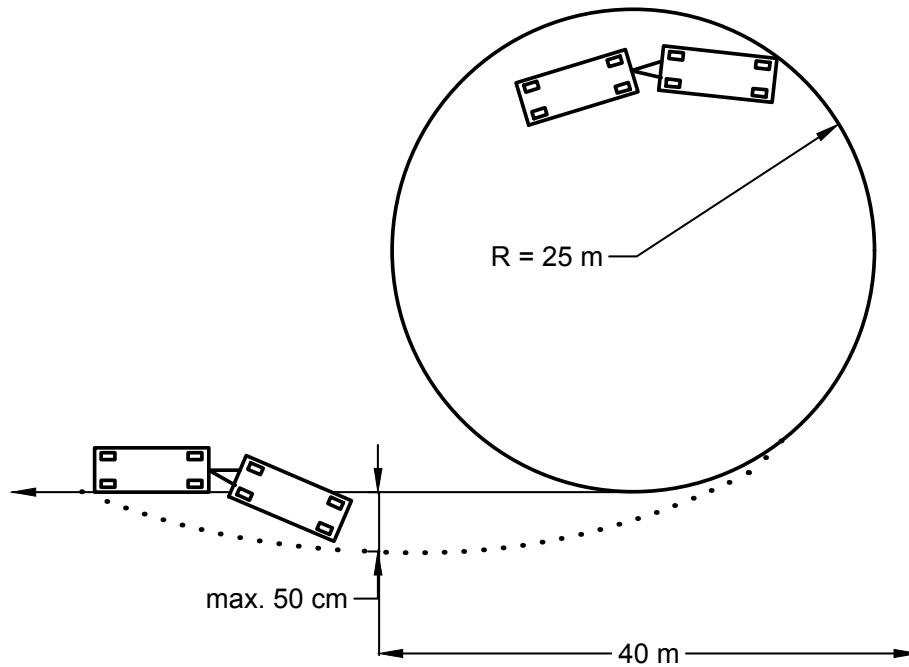


FIG. 3 LAYOUT FOR CIRCULAR MOVEMENT WITH TANGENTIAL PROJECTION

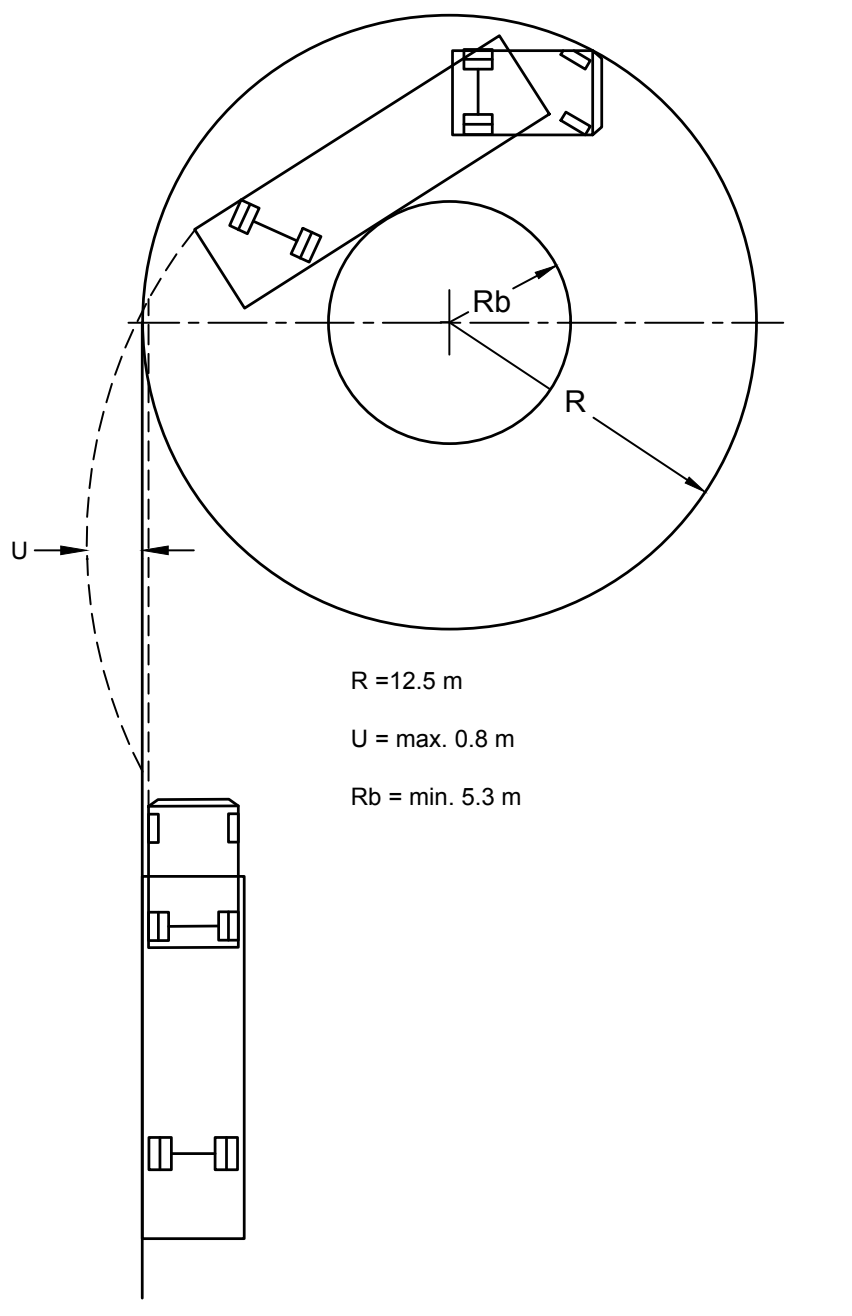
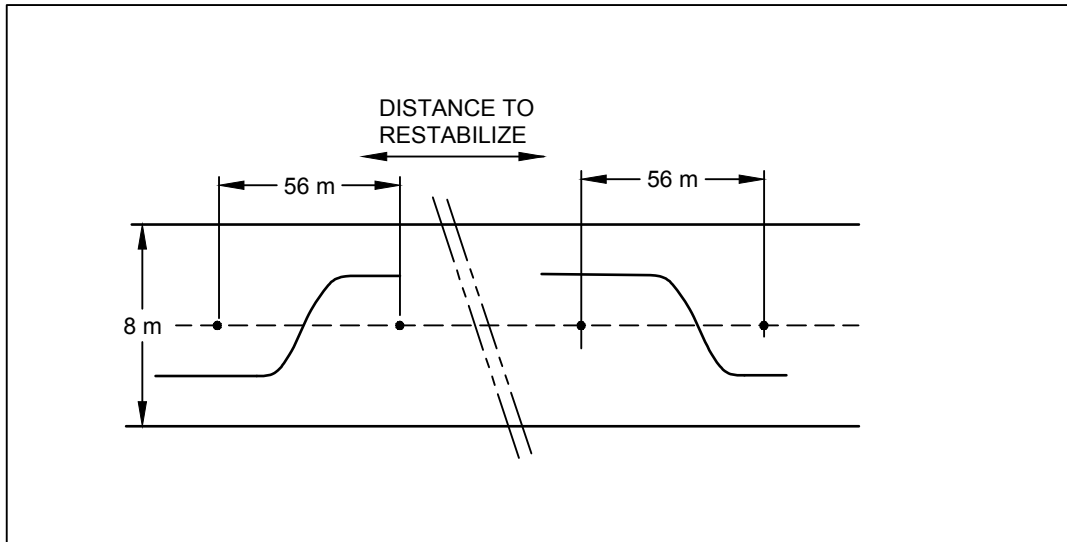


FIG. 4 LAYOUT FOR CIRCULAR MOVEMENT WITH TANGENTIAL PROJECTION

ANNEX D
(Clause C-2.3.1)
OVERTAKING TRACK



NOTE — This track arrangement may be subject to revision when superseded by an ISO Standard

ANNEX E*(Foreword)***COMMITTEE COMPOSITION**

Transport Tractors, Trailers and Industrial Trucks Sectional Committee, TED 22

<i>Organization</i>	<i>Representative(s)</i>
Automotive Research Association of India, Pune	SHRI A. AKBAR BADUSHA (Chairman) SHRI P. D. BETGERI (<i>Alternate</i>)
ACMA, New Delhi	SHRI UDAY HARITE SHRI JITENDER RANA (<i>Alternate</i>)
Ashok Leyland Ltd, Chennai	SHRI M. RAVI SHRI FAUSTINO V. (<i>Alternate</i>)
All India Motor Transport Congress, New Delhi	SHRI NAVEEN KUMAR GUPTA SHRI S. K. MITTAL (<i>Alternate</i>)
BEML Ltd, Bengaluru	SHRI A. S. THAMISELVAN SHRI MAHADEV NELLUR (<i>Alternate</i>)
Brakes India Ltd, Chennai	SHRI P. VENUGOPAL SHRI G. DEVENDRAN (<i>Alternate</i>)
CIRT, Pune	SHRI SAMIR SATTIGERI SHRI S. N. DHOLE (<i>Alternate</i>)
Container Corporation of India New Delhi	GENERAL MANAGER (TECH.)
Chennai Port Trust, Chennai	SHRI N. A. KAMATH SHRI V. RAM DOSS (<i>Alternate</i>)
Deptt of Heavy Industries & Public Enterprises, New Delhi	SHRI B. K. MISHRA SHRI R. K. JAISWAL (<i>Alternate</i>)
DGQA, Pune	SHRI MAHESHKAR P. P. SHRI N. SARAVANAN (<i>Alternate</i>)
Directorate General of Factory Advice & Labour Institutes	SHRI H. CHATTOPADHAYAYA SHRI R. N. MEENA (<i>Alternate</i>)
Godrej Boyce Mfg Co. Pvt Ltd, Mumbai	SHRI VINAY G. KULKARNI SHRI A. S. TAWDE (<i>Alternate</i>)
Cargotec India Private Limited, Chennai	SHRI S. SRINIVAS SHRI DEVARAJ NARAYAN (<i>Alternate</i>)
Jost's Engg Company Ltd, Thane	SHRI GIRISH MALVIYA SHRI S. J. BUCH (<i>Alternate</i>)
KION India Pvt Ltd, Pune	SHRI SUNIL K. GUPTA SHRI RIZWAN KHAN (<i>Alternate</i>)
Knorr-Bremse Commercial Vehicle System India Private Limited, Pune	SHRI ARUN BISHT SHRI ATUL INGOLE (<i>Alternate</i>)
Machine & Oil Mill Stores, Howrah	SHRI DEEPAK GHOSH
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